Introduction

Human Culture and Space Heritage

In the most fundamental terms, space heritage is a reflection of past human culture. In 1871, British anthropologist Edward B. Tylor first used the term *culture* to embrace “the complex whole, which includes knowledge, belief, art, morals, law, customs, and any other capabilities and habits acquired by [humans] as a member of society” (Tylor 1871: 1). Many other definitions of *culture* have been advanced over the decades since then, but they all generally speak to the concept of “the complex whole.” This idea evolved into a recognition by the field of anthropology that the study of human culture requires a holistic approach—one that takes into account human behavior from multiple perspectives.

The concept of holism recognizes that human societies are best studied as the systematic sums of their parts; human culture is composed of various aspects of sociology, psychology, linguistics, biology, archaeology, history, political science, and religion. In other words, human culture is a multifaceted coagulation of ideas, worldview, beliefs, experiences, places, and objects that can be understood only within its own context.

Much as the study of a society’s religion cannot, in and of itself, explain the concept of marriage, the study of the archival record alone cannot solely account for the history of human space exploration. The history of human space flight is only partly documented by written documents and photographs in the archival record, only partly
explained by the political context of the Cold War space race, and only partly documented by oral histories of those who lived through some of our milestones, like the first human landing on the Moon. However, the information potential and contributions of the various physical facilities—such as rocket test stands, research and development facilities, and communications structures—that contributed to human space flight history have been underemphasized in modern historical literature. They represent the material culture of space exploration; they also physically exist. It is this important theme of “place-based” historic preservation of our space history culture that resonates throughout the following chapters.

Yet the term human culture is somewhat of an oxymoron. The diversity of human behavior present on Earth prohibits a single, universal definition of culture or humanity. This challenge was first tackled in the 1970s when NASA was faced with the need to summarize all of humanity on plaques affixed to Pioneer 10 and Pioneer 11 (figure I.1). Designed by Carl Sagan, the plaques were intended to relay to any extraterrestrials the spacecraft were to encounter the anatomy of a male and female human and Earth’s location within the solar system.

Albert A. Harrison (2014: 175) touches upon the complexities of speaking for Earth: “Deciding what might be important to another civilization would force us to move beyond our characteristically short time span and develop a long-term perspective. Determining what we should say and how to say it could be a useful self-study that fosters self-contemplation and encourages consensus. These deliberations could clarify how we see our place in the universe, what makes us human, and where we are going.”

As we turn our attention toward the universe, coming to consensus about how to define human culture to alien life forms is not easy. Among the questions raised during the development of the Pioneer plaques were fundamental ones: Should the humans be clothed? Should they hold hands? Neither portrayal is constant through time and societies on Earth.

Defining what makes us human has been the subject of anthropological discourse over the past century or more. Extensive cross-cultural research has come to the conclusion that culture is learned. Culture
is shared and patterned within individual societies. Culture inevitably changes. In fact, if there is any single constant in human culture, it is change.

American society in the twenty-first century is very different from that of the 1950s: much of what we do and think, from how we telephone a friend to how we communicate—even how we view the cultural construct of human “races” has changed only over a period of a half century. These changes represent only a small fraction of the explosion of cultural development that humans have achieved over the past several million years. About 3.6 million years ago, our human ancestors walked upright across volcanic mud at Laetoli in eastern Africa, recording their footsteps into the archaeological record. They figured out how to break stones to create sharp edges for cutting up game at Olduvai Gorge in East Africa 2.5 million years ago. As early as 1.6 million years ago, they had learned how to control fire. By 1969, they had honed that knowledge to use fuel-based jet propulsion technology to
propel humans to the Moon, where they recorded our first footprints among the fine lunar sediments at Tranquility Base (figure I.2).

In the almost 4 million years that passed between Laetoli and Tranquility Base, humans underwent minor anatomical changes, with the exception of increased brain size, compared to the sizeable changes to our culture. We migrated into new territory, experiencing new environments and other cultures. We learned to hunt and gather, create tools, invent language and writing, and develop religion, art, and literature. We figured out how to protect our feet on Earth and on the Moon by inventing footwear. Through archaeology, we chronicle these important achievements primarily by studying the places, artifacts, and features left behind, because in most instances, that is all we have.

Figure I.2. Human footprint on the Moon, July 20, 1969 (photo AS11-40-5878, courtesy of NASA).
Humanity is once again migrating—exploring our universe, off-Earth—and again find ourselves in unfamiliar territory. We are faced with the need to adapt to new environments, and we do this just as our ancestors did: through a process. We invent new tools, we change our behavior, and we learn from others. Cultural change is not only inevitable, it is critical to human survival.

The rate at which this process of adapting and changing our culture occurs, however, has been rapidly increasing. Anecdotal stories from former NASA employees say that there is more computerized technology present in a singing greeting card than was present in the Apollo command module. Tools and equipment for use on the Moon were designed and manufactured, but documentation was discarded so quickly that for some tools used for Apollo 11, only prototypes appear to exist on Earth. Our material culture—our artifacts—are becoming obsolete and are being replaced quickly by newer, better, and faster objects and equipment. These artifacts, similar to the written record, are creating a material record that documents not only our movement into space but also our technological and scientific advancements over time.

The development of written language that began about five thousand years ago led to our ability to document our culture’s change in written form—something that our ancestors at Laetoli could not do. For example, preserved in the archives and made available to the public is the three-hundred-page “Apollo 11 Mission Report,” which provides details about every aspect of the mission, from the exact mission flight schedule to how lunar rocks were sampled. Our history is being documented in written and visual form in an unprecedented manner through countless historical overviews, photographs, and videos. Unfortunately, the locations and facilities that are cited in these accounts are hidden in a sea of words. Just as important to the history of human space exploration are rocket test stands for pre-Saturn rockets, and the arroyo in southern California where jet propulsion technology was first tested, and the factories that manufactured the Apollo command module. These places receive far less attention from the historical community but were no less important to the success of the missions. Collectively, our space heritage is composed of the records, artifacts,
structures, and places that chronicle the movement of humans off Earth and into space.

One of the subdisciplines of anthropology that is especially relevant to the study of the human exploration of space is archaeology. A working definition of archaeology is the study of the relationships between material culture and human behavior (Rathje and Schiffer 1980). Essentially, archaeologists study the artifacts, features, and sites that humans created and how they reflect the human activities carried out at the places they are found. Collectively, these objects and places form an archaeological record of past human behavior, which is not always replicated in a written record. More important to the subject at hand is that archaeology, by definition, is “place based.”

This notion of “place-based” historic preservation is critical to the thesis advanced in this book: that our history is anchored to specific locations on Earth (or the Moon) and that the location of any given historical event often still conveys the significance of the event that occurred there. This concept is not new to heritage preservation; the idea that ancient or modern archaeological sites represent past human